

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

OYSTER OPTICS, LLC,

Plaintiff,

v.

**INFINERA CORPORATION,
CORIANT (USA) INC.,
CORIANT NORTH AMERICA,
LLC, and CORIANT
OPERATIONS, INC.,**

Defendants.

Civil Action No. 2:19-cv-00257

DEFENDANTS' RESPONSIVE CLAIM CONSTRUCTION BRIEF

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UNLESS OTHERWISE SPECIFIED, ALL EMPHASES IN THIS BRIEF HAVE BEEN ADDED

INTRODUCTION

The parties’ sole claim construction dispute is whether “phase modulate”—a term this Court has already interpreted twice in prior suits involving the same parties—excludes amplitude modulation. In 2017, this Court resolved essentially the same dispute in Infinera’s favor. By early 2018, Oyster itself argued that “the *correct* claim construction . . . requires phase modulation *with no amplitude modulation*.” Ex. A, Pl. Oyster Optics, LLC’s Opp’n To Defs’ Mot. For Partial Summ. J. Of Noninfringement Based On The Absence Of “Phase Modulation” (“OSJO”), Case No. 2:16-cv-01302, Dkt. No. 393 at 19. This Court relied on Oyster’s argument to deny summary judgment of noninfringement. Then, when Oyster sued Infinera again on the same patent portfolio, it stipulated that it would not seek to “revisit[]” terms this Court construed in the first case. Ex. B, Joint Stipulation Concerning Severance Of Member Case No. 2:16-cv-1295 and Consolidation With Case No. 2:18-cv-00206, Case No. 2:16-cv-01302, Dkt. No. 595-1 at 2. Now, no longer bound by that stipulation, the parties find themselves right back where they started—arguing about whether “phase modulate” excludes amplitude modulation. The question before the Court is therefore whether it should abandon its prior construction. It should not.

Oyster’s arguments for departing from the Court’s prior construction hinge on its assertion of a different patent from the same portfolio. But Oyster’s newly-asserted patent and its previously-construed patents both have the same sole inventor, share the same technical field, address the same purported problems in the art, share the same goals, and use the same terminology. The record in this case is not meaningfully different from the record this Court previously considered. Indeed, the new patent at issue was already part of the intrinsic record in the previous case. Accordingly, there is no basis for revisiting the Court’s prior construction.

Moreover, Oyster’s asserted patent shares essentially the same intrinsic record that led this Court to exclude amplitude modulation in the parties’ prior suits. The stated purpose of all Oyster’s patents—enhancing the security of data transmitted across a fiber optic telecommunications network—relies on the consistent amplitude of phase modulated optical signals to prevent and detect taps or breaches. Oyster’s patents thus consistently denigrate amplitude modulation, making clear that it should be used only in a “non-secure” mode. Only when keeping amplitude constant can eavesdroppers be readily detected and security achieved. Interpreting the patents’ secure phase modulation to include non-secure amplitude modulation, as Oyster asks the Court to do, would thus defeat the entire purpose of Oyster’s patents.

Because the intrinsic evidence continues to support this Court’s prior construction, the Court should reaffirm that “phase modulate” excludes amplitude modulation.

BACKGROUND

I. Relevant Procedural History

Plaintiff Oyster Optics, LLC (“Oyster”) filed its complaint in this third round of litigation against Defendants Infinera Corporation, Coriant (USA) Inc., Coriant North America, LLC, and Coriant Operations, Inc. (collectively, “Defendants”) on July 29, 2019, asserting infringement of U.S. Patent No. 6,665,500 (“the ’500 patent”). Because the Court is familiar with the lengthy history of the litigation between Oyster and Defendants, this brief will discuss only the history relevant to the parties’ claim construction dispute.

Oyster filed separate suits against Infinera and Coriant in late 2016. Those cases, along with others filed by Oyster, were consolidated for pre-trial purposes excluding venue. *See generally Oyster Optics, LLC v. Coriant Am. Inc. et al.*, No. 2:16-cv-01302-JRG (“*Oyster I*”).

1. The Parties to Oyster’s 2016 Suits Dispute Whether Phase Modulation Excludes Amplitude Modulation

One central claim construction dispute in the *Oyster I* case was whether the term “phase modulate” (and grammatical variations) in U.S. Patent Nos. 6,469,816 (“the ’816 Patent”), 6,476,952 (“the ’952 Patent”), 6,594,055 (“the ’055 Patent”), 7,099,592 (“the ’592 Patent”), 7,620,327 (“the ’327 Patent”), 8,374,511 (“the ’511 Patent”), 8,913,898 (“the ’898 Patent”), and 9,363,012 (“the ’012 Patent”) excluded amplitude modulation. *See* Ex. C, Defs’ Responsive Claim Construction Br. Under P.R. 4-5(B), Case No. 2:16-Cv-01302, Dkt. No. 165 at 1, n.1, 10. Like the ’500 patent, all of these patents identify Peter Snawerdt as the sole inventor, claim priority to patent applications filed at the same time in 2001, have identical or nearly identical specifications, are directed to the same technology and address the same purported problems in the art by using phase modulated optical signals to improve security.

The *Oyster I* defendants identified three primary reasons why the term “phase modulate” should be read to exclude phase modulation. First, the patents expressly described “phase-modulated signals” as having constant amplitude. Ex. C at 11. Second, the defendants explained that allowing the phase modulated signal’s “amplitude to vary with the data would” defeat the purpose of the invention by “expos[ing] the data to photodiode optical taps.” *Id.* at 11-13. Third, defendants showed that the patent specifications consistently disparaged amplitude modulated signals as easily tapped. *Id.* at 13-14. Oyster argued that the term “phase modulate” should not exclude amplitude modulation, relying on the doctrine of claim differentiation, expert testimony, and a portion of one patent specification stating that “‘amplitude-modulated transmitters . . . may also be used.’” Ex. D, Pl. Oyster Optics, LLC’s Reply Claim Construction Br., Case No. 2:16-cv-01302, Dkt. No. 167 at 5-6. Both sides agreed that the same construction should apply to all of

Oyster’s asserted patents. *See* Ex. E, *Oyster Optics, LLC v. Coriant America Inc.*, Case No. 2:16-cv-01302, Dkt. No. 190 (Claim Construction Mem. and Order) at 13 (E.D. Tex. Dec. 5, 2017).

2. This Court Rejects Oyster’s Arguments for Including Amplitude Modulation in Phase Modulation

This Court resolved that dispute in its December 5, 2017, *Markman* Order. *See* Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 18. It rejected Oyster’s construction—the same construction Oyster now requests in this case—holding that phase modulation required “keeping the amplitude of the light constant.” *Id.* at 10-18. This Court emphasized that Oyster’s patents’ specifications repeatedly “distinguish[]” between phase modulation and amplitude modulation and “disparage amplitude-modulated optical signals as being easily tapped.” *Id.* at 14. Thus, “the specification explains that the desired benefits of phase modulation are obtained only in the *absence* of amplitude modulation.” *Id.* at 17 (original emphasis). This Court also identified Claim 5 of the ’592 patent as particularly relevant because its “recital of ‘switching between’” an “amplitude-modulated mode and a phase modulated mode” “appears to imply a selection, at any given time, of either one or the other (not both at the same time).” *Id.* at 12. The Court acknowledged that other intrinsic evidence suggested that amplitude modulation and phase modulation were not “necessarily mutually exclusive,” *see id.* at 12-16, but concluded that “on balance . . . the ‘phase modulate’ terms should be interpreted so as to exclude amplitude modulation.” *Id.* at 17-18.

3. Oyster Concedes That Excluding Amplitude Modulation Was “Correct” To Avoid Summary Judgment of Noninfringement

Following this Court’s construction in the first case, the defendants moved for partial summary judgment of noninfringement. Ex. F, *Oyster Optics, LLC v. Coriant America Inc.*, Case No. 2:16-cv-01302-JRG, Dkt. No. 262 (“Defs’ Mot. For Partial Summ. J. of Noninfringement Based On The Absence Of ‘Phase Modulation’”) (Feb. 26, 2018). Oyster opposed the motion by

asking this Court to clarify its construction of “phase modulate.” Ex. A, OSJO at 15 (citing *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360-63 (Fed. Cir. 2008)). Specifically, Oyster urged this Court to “further construe ‘phase modulate’ . . . to make clear it only *excludes amplitude modulation*, not modulation that might ever include any variation in amplitude.” *Id.* Oyster then argued that summary judgment was not warranted “under the *correct claim construction*, which requires phase modulation *with no amplitude modulation*.” *Id.* at 19. This Court accepted Oyster’s argument, adopting the same construction that defendants now propose in this case: “alter the phase of light to create an optical signal having a phase that is representative of data. Use of phase modulation excludes use of amplitude modulation.” Ex. G, *Oyster Optics, LLC v. Coriant America Inc.*, Case No. 2:16-cv-01302, Dkt. No. 615 at 9 (“Memorandum Opinion and Order”) (E.D. Tex. Jun. 21, 2018).

4. Oyster Sues Infinera a Second Time

Oyster filed a second complaint against Infinera in May 2018. The Court severed the first Oyster-Infinera case from *Oyster I* and consolidated the two cases against Infinera. Ex. H, *Oyster I*, Order Granting Jt. Mtn. to Sever & Consolidate (E.D. Tex. June 8, 2018) (Dkt. No. 603). Although Oyster’s second case asserted a new patent against Infinera, the parties both stipulated that claim terms addressed in the first *Markman* hearing would not be revisited in the second case. Ex. B, Case No. 2:16-cv-01302, Dkt. No. 595-1. The Court ultimately granted summary judgment in favor of Infinera on its license and release defenses. Ex. I, Case No. 2:18-cv-00206-JRG, Dkt. No. 86 (E.D. Tex. Jun. 25, 2019). Oyster’s appeal of that judgment remains pending. *See* Ex. J, Case No. 2:18-cv-00206-JRG, Dkt. No. 93.

5. Oyster Reverses Course and Argues that Phase Modulation Can Now Include Amplitude Modulation

Despite agreeing that the same construction of “phase modulate” should govern every other

patent in its portfolio, arguing that the “correct” construction “requires phase modulation with no amplitude modulation,” and stipulating not to revisit this Court’s prior constructions in the second case, Oyster rebuffed Defendants’ offer to streamline the case by simply accepting the Court’s prior constructions again in this case. Ex. K. Instead, Oyster asks this Court to undo all the work it did construing “phase modulate” in the first case.

II. Background of the ’500 Patent and the Relevant Technology

1. Background on Fiber Optic Communications Networks

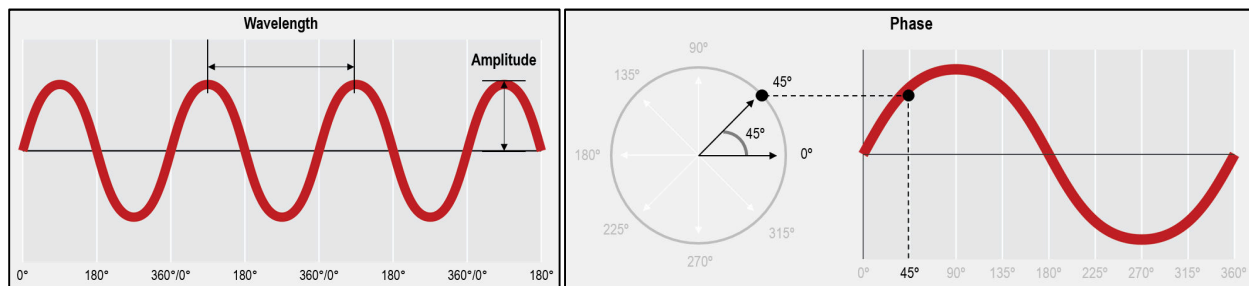
In fiber optic networks, optical (light) signals convey data from a transmitter to a receiver across thin, flexible strands of glass called optical fibers. Optical transmitters include lasers for producing light that can be represented mathematically as a wave with four basic characteristics:

Wavelength is the spatial period of the wave, shown in the diagram below as the distance between the peaks of the wave.

Amplitude is the magnitude of the wave, shown in the diagram below as the height of the peak of the wave.

Frequency is how often the wave completes a cycle per unit of time.

Phase refers to the point in the cycle of a wave at a given time. It usually is measured as an angle or a number of degrees, such as 90 or 180 degrees.

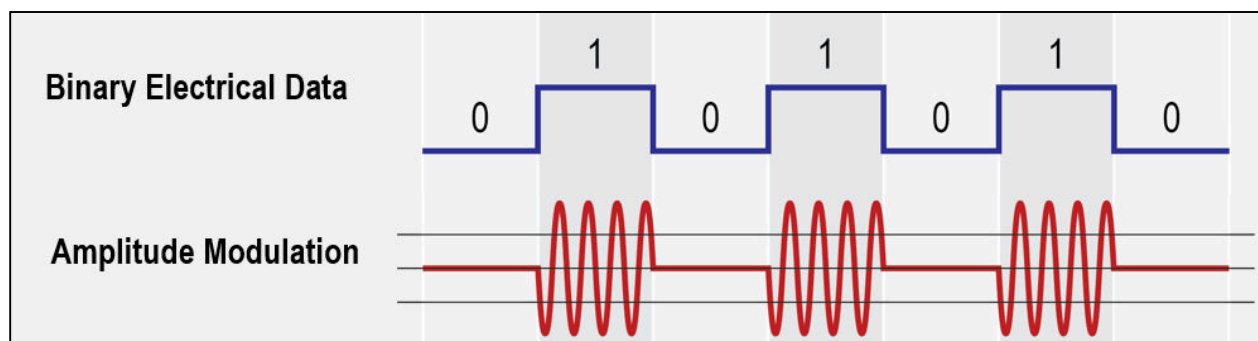


See, e.g., Defendants’ Technology Tutorial, Dkt. No. 69.

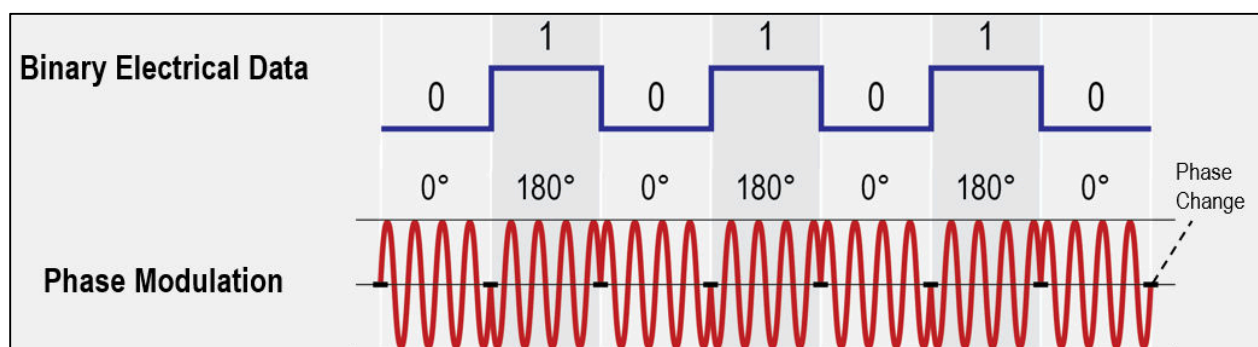
The light produced by a laser is referred to as a “carrier” wave because it carries the data

to be transmitted across the network. The data is input to the transmitter in electrical form as a series of digital bits (“0” and “1”). The transmitter includes a modulator which receives this electrical input data and alters some property of the laser light to reflect the input data. In essence, the modulator impresses the input data onto the carrier wave produced by the laser in order to render an optical data signal suitable for transmission across the optical fiber.

There are many different techniques for modulating a carrier wave with data. The ’500 patent focuses on two techniques: amplitude modulation and phase modulation. Amplitude modulation involves varying the amplitude of the optical carrier wave to reflect the input data.

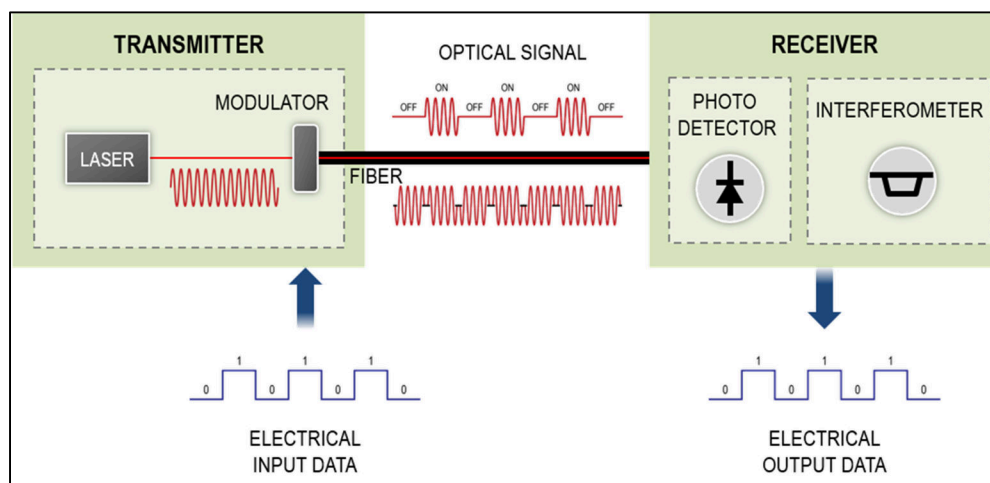


In contrast, phase modulation involves varying the phase of the optical carriers to reflect the input data, while maintaining the amplitude of the wave as constant.



The transmitted data is received at a receiver which includes components to demodulate the received signal (which basically involves extracting the data signal that was modulated onto

the carrier wave at the transmitter) and to interpret the extracted data for use at the receiver. A fiber optic telecommunications system including the above-described components is shown below.



2. The '500 Patent Invention: Switching Between a Secure Phase-Modulated Mode and a Non-Secure Amplitude-Modulated Mode

The Court is familiar with the technology underlying Oyster's patent portfolio, which focuses squarely on improving the security of fiber optic transmission systems. The '500 patent addresses this objective by disclosing a system that can switch between a secure transmission mode and non-secure mode. It explains that the secure mode is a phase-modulated mode. '500 Patent at 5:34-44 (describing a "phase-modulation mode" as "a secure data transmission mode"). In contrast, the amplitude modulation modes are non-secure modes. *Id.* at 7:51-53 ("Controlling of the change *between secure mode and the amplitude-modulated modes* can function in a variety of ways, depending on the overall system configuration").

In stressing its goal of providing improved security, the '500 patent explains that optical signals may be illicitly "tapped" by third parties to intercept the data being transmitted. *Id.* at 1:28-37. When a fiber is tapped, some of the light energy is extracted by the tapper, causing the signal's amplitude to fluctuate. According to the '500 patent, detecting such tapping of amplitude modulated optical signals is more difficult than detecting tapping of phase modulated signals. This

is because the amplitude fluctuations caused by tapping may be indistinguishable from the normal amplitude variations caused by amplitude modulation. In contrast, a phase modulated optical signal has a constant amplitude, so any amplitude variations from tapping are much more easily detected. *Id.* This is why the '500 patent repeatedly refers to the amplitude mode as the “non-secure” mode and the phase modulation mode as the “secure” mode and, like Oyster’s other patents, criticizes amplitude modulation as non-secure. *Id.* at 2:48-52, 6:8-19, 7:52-57, 8:12-16.

The '500 patent is closely interrelated with Oyster’s patents from its prior suits. Like Oyster’s other patents, it lists Peter Snawerdt as its sole inventor. It also incorporates by reference the entirety of Oyster’s '055 patent, which is entitled “Secure Fiber Optic Telecommunications System and Method.” The '055 patent is therefore part of the '500 patent’s specification. The '055 patent teaches a fiber optic data transmission system that uses only phase modulation due to its increased security and denigrates the use of amplitude modulation as non-secure and vulnerable to tapping. '055 patent at 1:28-39. Every claim of the '055 patent is directed to a phase-modulated fiber optic data transmission system that transmits “phase-modulated optical signal[s] ... ***being free of amplitude modulation.***” *Id.* at 6:50-55, 7:58-61, 8:13-15 and 8:48-50. The '500 patent is also incorporated by reference into Oyster’s '592 patent, together with the '055 patent. '592 patent at 2:50-59. Indeed, claim 5 of the '592 patent—which this Court relied on for its previous construction—incorporates the '500 patent’s invention of a switch for switching between an amplitude-modulated mode and a phase-modulated mode. '592 patent at cl. 5; *see also id.* at 5:29-34 (referring to the '500 patent for the details of the dual-mode system and switch).

LEGAL STANDARDS FOR CLAIM CONSTRUCTION

Claim language is interpreted from the perspective of a person of ordinary skill in the art who is “deemed to read the claim term not only in the context of the particular claim in which the

disputed term appears, but in the context of the entire patent, including the specification.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*). “[T]he specification ‘is always highly relevant,’” and “[u]sually, it is dispositive; it is the single best guide to the meaning of a disputed term.”” *Id.* at 1315 (quoting *Vitrionics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Material expressly incorporated by references is part of the specification because an express incorporation of another reference “‘makes clear that the material is effectively part of the host document as if it were explicitly contained therein.’” *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1376 (Fed. Cir. 2006) (quoting *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000)).

ARGUMENT

I. “phase modulate” (and grammatical variations) (Claims 1, 8, 16, 17, 19)

Oyster’s Proposed Construction	Defendants’ Proposed Construction
alter the phase of light to create an optical signal having a phase that is representative of data	alter the phase of light to create an optical signal having a phase that is representative of data. Use of phase modulation excludes use of amplitude modulation.

The sole dispute between the parties is whether to deviate from this Court’s clarified construction of “phase modulate” from the previous cases. There is simply no reason to do so.

The intrinsic record is nearly identical. It contains the same or highly similar disparaging comments regarding amplitude modulation. Indeed, because Oyster’s ’592 patent incorporates the ’500 patent by reference, the ’500 patent was itself part of the intrinsic record in the prior cases. It has the same security-enhancing objective, which would be undermined by amplitude modulating phase modulated signals, exactly as was the case for Oyster’s other patents. All this Court’s prior reasons for excluding phase modulation remain true. And Oyster’s arguments against this Court’s prior construction are highly similar to arguments this Court already

considered and rejected in the first case. In short, broadening “phase modulate” to allow for amplitude modulation is unwarranted. Oyster’s proposal should be rejected.

1. The Intrinsic Evidence for the ’500 Patent Aligns with the Evidence Resulting in this Court’s Prior Construction

As discussed above, the parties had the same dispute during the *Markman* process in *Oyster I*, and this Court held that “phase modulate” excluded amplitude modulation. Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 18. This Court reached that holding based on several relevant considerations which are mirrored in the ’500 patent. This confirms that the ’500 patent should have the same construction of “phase modulate” as the rest of Oyster’s portfolio.

First, this Court correctly recognized that detecting a drop in amplitude of a signal having a constant amplitude (*i.e.*, a phase-modulated signal) is useful for enhancing security of a fiber optic network. Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 12. The same security concerns motivating the Court’s prior construction are emphasized in the ’500 patent, which states that amplitude modulated transmissions were vulnerable to tapping because an eavesdropper need only siphon off a small amount of light to recreate the electronic data stream. *See* ’500 patent at 1:12-37. In contrast, the ’500 patent explains, “Detector 33 monitors, **during the phase-modulation transmission mode**, the light energy in the fiber 20 via the light energy coupled to the detector by splitter 31. **If the amplitude drops during this mode, most likely from a tap, the detector alerts the receiver** and can, for example, sound an alarm or alert network maintenance personnel.” *Id.* at 6:40-45. That is why the ’500 patent refers to its phase-modulated mode as “secure” and its amplitude-modulated mode as a “non-secure mode.” *Id.* at 2:48-52 (“The controller in the first mode preferably **phase-modulates** the light The first mode is **thus a highly secure data transmission mode**[.]”); *see also id.* at 6:8-19, 7:52-57, 8:12-16.

Second, this Court also emphasized that Oyster’s patents’ specifications disparaged

amplitude modulated signals as easily tapped. Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 14. The '500 patent does the same. It discloses, “optical fiber may be tapped. . . . Amplitude-modulated optical signals, with their ease of detection from a photodiode, require that only a small amount of energy be tapped and passed through the photodiode in order to be converted into a tapped electronic data stream.” '500 patent at 1:12-37. It also repeatedly disparages amplitude modulation by describing it as a “non-secure” alternative to “secure” phase modulation. *Id.* at 6:8-19, 7:52-57, 8:12-16.

Third, the Court relied upon Claim 5 of the '592 patent, which focuses on “switching between” amplitude- and phase-modulated modes because this implied “a selection, at any given time, of either one or the other (*not both at the same time*).” Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 12. That reasoning is directly applicable to the '500 patent, which teaches “switching between the phase modulating and the amplitude modulating steps,” '500 patent at 4:27-28, and transmitting “*amplitude-modulated signals . . . during a first time period and phase-modulated signals . . . during a second time period* subsequent or prior to the first time period.” *Id.* at 4:32-35; *see also id.* at Abstract. Indeed, the '592 patent incorporates the '500 patent by reference as its support for the switching functionality this Court relied on for its previous construction. Dkt. No. 70-8 ('529 patent) at 5:29-34, 2:50-59. Thus, the Court reached its construction in the first instance in part by relying on the '500 patent’s alleged invention.

Indeed, the '500 patent is replete with statements that optical signals in its invention are either phase-modulated or amplitude-modulated—but not both. It describes the “object[s] of the present invention” as a transmitter and receiver for transmitting or receiving “*either* phase-modulated *or* amplitude-modulated optical signals.” '500 patent at 2:26-31. It also repeatedly distinguishes between two operational modes: a mode in which phase modulation occurs and a

second *alternative* mode in which amplitude modulation occurs. '500 patent 2:35-40 (“the controller in a first mode controlling the phase modulator so as to create phase-modulated optical signals in the light as a function of the electronic data stream and the controller in a second *alternate* mode amplitude-modulating the light as a function of the electronic data stream.” (emphasis added)); *id.* at 4:4-12; *id.* at 8:1-2 (“Depending on the mode data, the transmitter transmits in a phase-modulated or amplitude-modulated mode.”).

The '500 patent teaches that phase modulated signals are transmitted in one mode and amplitude modulated signals are transmitted in another mode. *Id.* at 4:13-20. Thus, rather than transmit signals that are both phase modulated and amplitude modulated at the same time, the '500 patent teaches “switching between the phase modulating and the amplitude modulating steps,” *id.* at 4:27-28, so that phase and amplitude modulation used at two different times. *Id.* at 4:32-35. If “phase modulation” was as broad as Oyster contends, this teaching of discrete period of time for each mode would be superfluous. As such, Oyster’s attempt to include amplitude modulation in the phase-modulation mode is inconsistent with the specification.

The specification also indicates that the amplitude of the light is kept constant during the phase-modulation mode. '500 patent at 5:34-35 (“During the alternate phase-modulation mode, the amplitude controller 88 directs the laser to emit constant wavelength, *non-pulsed light*.”).¹ It is this constant-amplitude, phase-modulated mode in that “provides a secure data transmission mode.” *Id.* at 5:44. In the secure mode, this constant-amplitude, phase-modulated signal allows an energy level detector to immediately recognize a loss in energy to detect an eavesdropper. *See, e.g.,* '500 patent at 40-45 (“Detector 33 monitors, during the phase-modulation transmission mode,

¹ “Non-pulsed light” is another way the '500 patent teaches constant amplitude. '500 Patent at 1:13-16 (“The laser amplitude modulator typically *pulses* or alters the laser output to create amplitude-modulated optical signal representative of the electronic data stream.”).

the light energy in the fiber 20 via the light energy coupled to the detector by splitter 31. If the amplitude drops during this mode, most likely from a tap, the detector alerts the receiver and can, for example, sound an alarm or alert network maintenance personnel.”). A constant-amplitude signal is essential to the secure transmission mode (*i.e.*, phase-modulation mode) because any drop in the amplitude of the signal indicates that an eavesdropper tapped the fiber and is siphoning off power. *See* ’500 patent at 1:28-37 (describing how an eavesdropper can tap an amplitude modulated signal to siphon off power).

Moreover, as noted *supra*, the specification of the ’500 patent repeatedly and explicitly incorporates by reference the ’055 patent in its entirety. *See, e.g., id.* at 2:51-57 (“The first mode is thus a highly Secure data transmission mode, as described in co-owned and co-pending U.S. patent application Ser. No. 09/765,153, entitled “Secure Fiber Optics Telecommunications System and Method” and filed on Jan. 17, 2001, the entire disclosure of which is hereby incorporated by reference herein.”); *see also id.* at 3:6-11, 5:52-55, 5:63-67, 6:15-25. In other words, the ’500 patent explains that the phase modulation mode is described in the ’055 patent. This material is part of the intrinsic evidence for claim construction purposes because incorporated-by-reference material “‘is effectively part of the host document as if it were explicitly contained therein.’” *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1376 (Fed. Cir. 2006) (*quoting Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000)).

The ’055 patent unambiguously teaches that this secure phase-modulation mode excludes amplitude modulation for the exact same reason taught in the ’500 patent—security. *See, e.g.,* ’055 patent at 1:9-10; *id.* at 2:23-25. Achieving this security goal requires excluding amplitude modulation from a phase modulation mode because detecting an eavesdropper in the phase-modulated modes for the systems described in the ’500 and ’055 patents requires the transmitted

signal to have a constant amplitude. '500 patent at 5:34-36; '055 patent at 5:8-9. Constant amplitude is necessary because tap detection in both patents is accomplished by measuring the received signal's energy level. '500 patent at 6:40-45; '055 patent at 5:12-15. In an amplitude modulated signal, the energy level varies based on the input electronic data stream, so received signal's energy level varies widely. In contrast, in the phase-modulated modes of the '500 and '055 patents, the signal's energy level does not vary (because the amplitude does not vary), so any drop in received signal power almost certainly indicates a tap and triggers the alarm. '055 patent at 2:62-64; 5:15-18. This is why both patents repeatedly disparage amplitude-modulated optical signals as easily tapped, in contrast to phase-modulated signals, which are more difficult to eavesdrop. '500 patent at 1:28-39; '055 patent at 1:29-38, 2:50-56. It is also why every independent claim of the '055 patent explicitly excludes amplitude modulation from a phase-modulated signal. '055 patent at cl. 1, 15, 17, 27. As this Court previously recognized, "the desired benefits of phase modulation are obtained only in the absence of amplitude modulation." Ex. E, Case No. 2:16-cv-1302-, Dkt. No. 190 at 17.

Accordingly, the most reliable piece of intrinsic evidence – the patent specification – clearly, consistently and repeatedly confirms that the secure phase modulation mode of the invention does not include non-secure amplitude modulation.

2. The '500 Patent's Prosecution History Confirms the Correctness of This Court's Prior Construction

While differences in two patents' prosecution histories could sometimes justify giving the same term different constructions, Oyster does not rely on any prosecution history for the '500 patent to support its position. That is not surprising, because the prosecution history only confirms that the '500 patent's phase modulation mode excludes amplitude modulation.

The examiner rejected claims then numbered 19-21 which issued as claims 17-19 in view

of U.S. Patent No. 6,122,086 to Djupsjobacka. Ex. L – Mar. 13, 2003 Office Action. In response, the applicant explained that “Djupsjobacka discloses *simultaneous transmission* of optical signals in AM or PM Mode, the same signal being sent in AM and PM mode *at the same time*.” Ex. M at 6 – Response to Office Action of June 11, 2003. The applicant argued that its claimed invention required using amplitude-modulated and phase-modulated modes at *different times*, and was therefore distinguishable over Djupsjobacka. Ex. M at 7 - Response to Office Action of June 11, 2003. The prosecution history thus precludes reading “phase modulate” to include amplitude-modulated signals, as Oyster urges.

3. Giving “Phase Modulate” a Different Meaning in the ’500 Patent Would Render Oyster’s Patents Internally Inconsistent

As noted, *supra*, the specification of the ’500 patent repeatedly and explicitly incorporates by reference the ’055 patent in its entirety. *See, e.g.*, ’500 patent at 2:51-57. Similarly, the ’500 patent is itself incorporated by reference into the ’592 patent to support the ’592 patent’s dual-mode claims. Dkt. No. 70-8 (’529 patent) at 5:29-34, 2:50-59. Thus, the ’500 patent was part of the intrinsic record for the ’592 patent. *Cook Biotech*, 460 F.3d at 1376. This Court relied on the intrinsic evidence of the ’592 patent (which includes the ’500 patent) to render its prior construction of “phase modulate” which excludes amplitude modulation.

As detailed in Section I(1), *supra*, the ’055 patent discloses a secure fiber optic data transmission system that uses only constant-amplitude phase-modulated optical signals due to their enhanced security and denigrates amplitude modulation as non-secure. *See, e.g.*, ’055 patent at 1:29-38. Oyster’s proposed construction which permits the phase-modulated mode to also include amplitude modulation thus eviscerates the security aspects to which the ’500 and ’055 patent are directed. Oyster offers no justification for reading its two patents inconsistently.

Importantly, there is a heavy presumption “that the same claim term in the same patent or

related patents carries the same construed meaning.” *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314 (Fed. Cir. 2003). Giving “phase modulate” a different meaning in the ’500 patent from the ’055 patent and ’592 patents would violate this principle. After all, due to incorporation by reference, the entire text of the ’055 patent is part of the ’500 patent’s disclosure, and the entire text of the ’500 patent is part of the ’592 patent’s disclosure. *Cook Biotech*, 460 F.3d at 1376. Yet, if Oyster’s position were correct, the same term—“phase modulate”—would mean different things in different parts of that combined disclosure. Thus, not only would Oyster’s approach wrongly give the same term different meanings between these closely related patents, it would also give the same term inconsistent meanings within their own specifications. That cannot be right.

4. Oyster Fails to Justify Departing from this Court’s Prior Construction

Oyster points to various passages in the ’500 patent as supposedly requiring a different construction for “phase modulate.” Oyster Br. at 5-9. These arguments cannot differentiate this case from the prior litigation. As an initial matter, because the ’500 patent was incorporated into the ’592 patent by reference, its entire disclosure was already part of the intrinsic record in the prior case. *See, e.g.*, Dkt. No. 70-8 (’529 patent) at 5:29-34, 2:50-59; *Cook Biotech*, 460 F.3d at 1376. If the ’500 patent’s claims or specification mandated a broader construction of “phase modulate,” that would have therefore been equally applicable in *Oyster I*. The ’500 patent’s specification therefore cannot support a different construction in this case.

Indeed, the unusual history of this dispute means that two different forms of estoppel bar Oyster from now arguing that “phase modulate” can include amplitude modulation. First, having unsuccessfully argued against excluding amplitude modulation during the *Markman* phase of *Oyster I*, Oyster is collaterally estopped from relitigating the issue in this case. *See Nestle USA, Inc. v. Steuben Foods, Inc.*, 884 F.3d 1350, 1351-52 (Fed. Cir. 2018). Oyster will likely argue that

collateral estoppel should not apply because the '500 patent is a “different invention” from those at issue in *Oyster I*. See *Oyster Br.* at 1-2, 9. But the Federal Circuit rejected that same argument in *Nestle*. 884 F.3d at 1351-52. There, the Federal Circuit had previously construed the term “aseptic” in one patent, and the issue was whether collateral estoppel applied to a different patent. *Id.* The Court held that collateral estoppel applied because “collateral estoppel is not limited ‘to patent claims that are identical’” and instead “the identity of the *issues* that were litigated determines whether collateral estoppel should apply.” *Id.* (original emphasis) (quoting *Ohio Willow Wood Co. v. Alps S., LLC*, 735 F.3d 1333, 1342 (Fed. Cir. 2013)). Because the issue of whether “phase modulate” can include amplitude modulation was conclusively resolved in *Oyster I*, collateral estoppel applies, regardless of the '500 patent being a different patent. *Id.*

Oyster’s argument is also barred by judicial estoppel. Judicial estoppel precludes a party that prevailed on an issue from taking a clearly inconsistent position in the same or related litigation. See, e.g., *Transclean Corp. v. Jiffy Lube Int’l, Inc.*, 474 F.3d 1298, 1307 (Fed. Cir. 2007). “In particular, the Federal Circuit has stated that a party may be judicially estopped from asserting clearly inconsistent positions on claim construction.” *Id.* Here, after losing during the *Markman* phase of *Oyster I*, Oyster changed its position and argued that the “correct claim construction” of “phase modulate” requires “no amplitude modulation.” Ex. A, OSJO at 19. This Court adopted that argument in clarifying its prior construction and denied summary judgment of non-infringement on that basis. Ex. G, Case No. 2:16-cv-01302, Dkt. No. 615 at 8-9. Accordingly, Oyster should be judicially estopped from now arguing that the correct construction of “phase modulate” permits amplitude modulation. *Transclean*, 474 F.3d at 1307.

Even if Oyster were not estopped, its arguments largely parrot those advanced in the prior case, and thus fail to justify a different construction here. For example, Oyster argues that claim

differentiation requires a broader interpretation of “phase modulate” in light of dependent claim 18 of the ’500 patent. Oyster Br. 6-7. But Oyster made a nearly identical claim differentiation argument in the previous case, pointing to claims in the ’816 and ’055 patents that similarly required the absence of amplitude modulation. Ex. N, Pl. Oyster Optics, LLC’s Opening Claim Construction Br., Case No. 2:16-cv-01302, Dkt. No. 157 at 9. This Court rejected Oyster’s claim differentiation argument, explaining that claim differentiation “cannot enlarge the meaning of a claim beyond that which is supported by the patent documents, or relieve any claim of limitations imposed by the prosecution history.” Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 (quoting *Fenner Investments, Ltd. v. Cellco P’ship*, 778 F.3d 1320, 1327 (Fed. Cir. 2015); *see also id.* at 11-13 (“[R]edundancy that may arise in certain claims as a result of proceeding in this fashion does not warrant rejecting a construction” (citing *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1296 (Fed. Cir. 2012))).] Oyster’s resort to claim differentiation is even less persuasive here, where the prosecution history shows that Oyster distinguished the claims from the prior art by explaining phase modulation and amplitude modulation occur at different times. Ex. M at 7 - Response to Office Action of June 11, 2003. The only use of amplitude modulation the ’500 patent ever suggests in its secure, phase-modulated mode is where amplitude modulation is applied to *different* signals “not related to the input optical data stream.” ’500 Patent at 4:36-42. This would not affect security of the data signals because their amplitude would remain constant. *See id.*

Similarly, Oyster argues against this Court’s prior construction by arguing that it conflicts with the plain meaning of “phase modulation.” Oyster Br. at 6-7. But Oyster advanced this same “plain meaning” argument in *Oyster I*, and this Court nevertheless interpreted “phase modulate” to exclude amplitude modulation. Ex. D, Case No. 2:16-cv-01302, Dkt. No. 167 at 6; Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 10-18.

Oyster points to various passages in the '500 patent that describe using both amplitude and phase modulation. Oyster Br. at 5-6. Yet while Oyster did not rely on this exact language in *Oyster I*, it did unsuccessfully advance very similar arguments. For instance, Oyster pointed to language from the '898 patent indicating that ““conventional amplitude-modulated transmitters and receivers ... may also be used”” during the ““phase-modulated mode.”” Ex. N, Case No. 2:16-cv-01302, Dkt. No. 157 at 10 (quoting '898 patent at 4:44-52). Oyster also argued that the '816 patent disclosed an embodiment combining both phase and amplitude modulation. *Id.* This Court considered those arguments but still determined that, on balance, the patents' security-enhancing purpose, disparagement of amplitude modulation, and description of phase and amplitude modulated modes as separate alternatives dictated a construction excluding amplitude modulation. Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 10-18. Those same factors outweigh Oyster's intrinsic evidence here, for the same reasons this Court previously articulated.

Moreover, Oyster's arguments in this case rely on a tortured reading of the '500 patent specification that mixes and matches different embodiments, taking its descriptions of phase and amplitude modulation out of context. Oyster's argument that the Summary of the Invention section of the specification discloses three modes is simply a misreading of the specification. *See* Oyster Br. at 5-6. The correct reading is that the invention encompasses a phase-modulated transmission mode, an amplitude-modulated mode, or both of those two modes. '500 patent at 2:41-47. This is clear from the phrase “which can permit the transmitter to work with different types of receivers,” which immediately follows the discussing of having both a phase and amplitude modulated mode. *Id.* This phrase shows that the two are alternatives that allow compatibility with different types of receivers—not that they are combined, which would require a specialized receiver capable of handling both phase and amplitude modulation together. *See id.* That Oyster's reading is incorrect

is also demonstrated by the fact that the specification never provides any description of Oyster’s alleged third mode. The claims contain no reference to a third mode, either—they consistently describe only two modes: one phase-modulated mode, and one amplitude-modulated mode. *See generally*, ’500 patent at cl. 1 (covering only first and second modes), cl. 10 (same), cl. 11 (receiver receives two modes), cl. 16 (“dual-mode optical transmission system”), cl. 17 (“A method for transmitting optical data in two modes . . .”).

Similarly, the specification’s disclosure that an optical signal may be phase modulated in the delayed second mode (*e.g.*, ’500 patent at 3:1-3) is a red herring. Oyster Br. at 6. The specification is describing the non-secure ***amplitude modulation mode*** in this section, but the claim construction issue before the Court relates to the ***phase modulation mode***, and whether this secure phase-modulated mode can include amplitude modulation. Put another way, Defendants do not claim that “amplitude modulate” must be construed to exclude phase modulation. Unlike adding amplitude modulation to the secure-phase modulated mode, which would destroy the security benefits of that mode, adding phase modulation to the non-secure amplitude-modulated mode would not undermine the purposes of the invention. The intrinsic evidence Oyster cites concerns only the latter possibility—adding phase modulation to the amplitude modulated mode—it does not suggest that amplitude modulation can be added to the secure phase-modulated mode. *See* ’500 patent at 3:1-3, cl. 19. This is fully consistent with the Court’s reasoning in *Oyster I*, where the Court explained that “phase modulation and amplitude modulation” are not “necessarily mutually exclusive,” yet nevertheless concluded that “phase modulate” excluded amplitude modulation. Ex. E, Case No. 2:16-cv-01302, Dkt. No. 190 at 16-18. Whether the amplitude-modulated mode could hypothetically include phase modulation is therefore irrelevant to the issue before the Court.

Importantly, the specification of the '500 patent never teaches amplitude modulating data on the optical signal when transmitting in the secure mode, *i.e.*, phase-modulating mode. Indeed, the *only* instance in the specification where amplitude modulation is mentioned in the context of the secure phase modulation mode is a very brief mention at column 4, lines 36-43. This passage mentions that in the secure mode, if there is any amplitude modulation occurring, that “amplitude modulated signals *not related to the input optical data stream*” could be transmitted... without necessarily affecting security.” '500 patent at 4:36-43. In other words, control or other non-data information could be amplitude modulated in the secure mode as long as the data being transmitted is separately phase modulated. This is not a disclosure of phase-modulated signals also being amplitude-modulated. Rather, it describes using two different modulation formats for different signals. This disclosure is entirely consistent with the '500 patent's emphasis on security arising from the phase-modulation mode, and consistent with the proposed construction's requirement that the data being transmitted be phase modulated (“alter the phase of light to create an optical signal having a phase that is *representative of data*...”).

Finally, Oyster's arguments regarding alternating streams or mixed signals also misses the mark. Oyster Br. at 6. The '500 patent teaches that these signals are alternatively phase-modulated or amplitude-modulated and occur at different times. Nothing in Oyster's citations shows otherwise. *See, e.g.*, 3:27–30, 3:47–50, 3:62–64. In sum, Oyster's arguments do little more than rehash its unsuccessful arguments from *Oyster I*. This Court should therefore uphold its previous construction of “phase modulate.”

CONCLUSION

For the foregoing reasons, the Court should construe “phase modulate” to mean “alter the phase of light to create an optical signal having a phase that is representative of data. Use of phase modulation excludes use of amplitude modulation”, consistent with its prior construction of this term. This construction fully aligns with the intrinsic evidence of the ’500 Patent.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document has been served on May 19, 2020, to all counsel of record who are deemed to have consented to electronic service via electronic mail.

Dated: May 19, 2020

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